**Air Quality and Weather Connections Datasheet Answer Key**

How can we know how clean and healthy the air is?

Together, we are going to find out:

* How can we measure how clean (healthy) the air is that we breathe?
* Does the air carry particulate matter (PM)?
* What should we do when the air is dirty (unhealthy)?

|  |
| --- |
| **1. Let’s figure out how air quality is measured and why it’s important to know.** |
| First, watch the [Wildfires in the West Cause Air Pollution](https://www.youtube.com/watch?v=S7SdzcII4Mo). Do a think-pair-share on what you observed:   * Why do wildfires cause air pollution? * What happens to the air when there is a wildfire? * How do you think smoke from wildfire travels so far away? |
| The **Air Quality Index**, or **AQI** for short, is a rating system that tells us how healthy the air outside is.   * Watch [Be Smoke Ready: Know the Colors of the Air Quality Index (AQI)](https://youtu.be/NMVH0R8ycbI) to learn about how air quality is measured. * What should you do when the air outside is not healthy? |
| 1. As a class, look at the Air Quality Index chart.  * What information does it tell? * Which colors mean the air is healthy? * Which colors mean the air is unhealthy?      1. Use the AQI chart to help you complete the “What Color is Your Air” activity sheet for [grades 3-5](https://www.airnow.gov/publications/air-quality-flag-program-classroom-curriculum/activity-sheet-grade-3-5/). |

Results vary by data collected.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **2. Weather and Air Quality Data Table: Collect data at your school!** | | | | | |
| **Date** | **Weather Conditions &**  **PM 2.5 and Ozone Levels** | | | | **Air Quality Action Day?** |
| Day 1  Date: | Wind direction: | ⃞ Clear sky  ⃞ Slightly hazy sky  ⃞ Very hazy sky | PM level: | PM color: | Yes  No |
| Wind speed: | Temperature: | Ozone level: | Ozone color: |
| Day 2  Date: | Wind direction: | ⃞ Clear sky  ⃞ Slightly hazy sky  ⃞ Very hazy sky | PM level: | PM color: | Yes  No |
| Wind speed: | Temperature: | Ozone level: | Ozone color: |

Results vary by data collected.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Date** | **Weather Conditions &**  **PM 2.5 and Ozone Levels** | | | | **Air Quality Action Day?** |
| Day 3  Date: | Wind direction: | ⃞ Clear sky  ⃞ Slightly hazy sky  ⃞ Very hazy sky | PM level: | PM color: | Yes  No |
| Wind speed: | Temperature: | Ozone level: | Ozone color: |
| Day 4  Date: | Wind direction: | ⃞ Clear sky  ⃞ Slightly hazy sky  ⃞ Very hazy sky | PM level: | PM color: | Yes  No |
| Wind speed: | Temperature: | Ozone level: | Ozone color: |
| Day 5  Date: | Wind direction: | ⃞ Clear sky  ⃞ Slightly hazy sky  ⃞ Very hazy sky | PM level: | PM color: | Yes  No |
| Wind speed: | Temperature: | Ozone level: | Ozone color: |

Results vary by data collected.

|  |  |
| --- | --- |
| **3. PM Collector: When done collecting PM data, place this grid face down over the sticky side of the PM Collector.**  **Use a hand lens to count how many PM pieces are trapped in each square of the PM Collector. Record the number of pieces in section 4 of the datasheet.** | |
| **1** | **2** |
| **3** | **4** |

|  |
| --- |
| **4. Let’s analyze our PM 2.5 data and PM Catcher results.** |
| Review the **Air Quality data table** in section 2 where you recorded PM 2.5 and ozone data. |
| Answers vary by data collected.   1. Count the number of **PM 2.5 air quality** days for each AQI colors:  * Number of **green** days 🌝:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Total good PM air quality days: \_\_\_\_\_\_\_ * Number of **yellow** days 🙂:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * Number of **orange** days 🙁:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Total bad PM air quality days: \_\_\_\_\_\_\_ * Number of **red** days 🙁:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * Number of **purpl**e days 🙁:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  1. Count the number of **ozone air quality** days for each AQI colors:  * Number of **green** days 🌝:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Total good ozone air quality days: \_\_\_\_\_\_\_ * Number of **yellow** days 🙂:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * Number of **orange** days 🙁:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Total bad PM air quality days: \_\_\_\_\_\_\_ * Number of **red** days 🙁:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * Number of **purpl**e days 🙁:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  1. Adding PM and ozone data together, we’re there more **good air quality** days or **bad air quality** days overall? Circle your results:   **🙂 More clean, healthy air days**   **🙁 More dirty, unhealthy air days**   1. Record your **PM Collector data**:  * Total number of PM pieces in square 1: \_\_\_\_\_\_\_\_\_\_\_ * Total number of PM pieces in square 2: \_\_\_\_\_\_\_\_\_\_\_ * Total number of PM pieces in square 3: \_\_\_\_\_\_\_\_\_\_\_ * Total number of PM pieces in square 4: \_\_\_\_\_\_\_\_\_\_\_ * Average number of PM pieces (add totals 1 through 4 and divide by 4): \_\_\_\_\_\_\_\_\_\_\_ |
| **Class Reflection:** Share your thoughts on the following questions as a class:   * What is one thing you enjoyed in learning about **Air Quality**? * In your words, explain the connection between **haze and PM**? More haze means higher PM. * Do you think the **wind affects the amount of PM** in the air? Yes, wind moves PM in the air. High winds can push PM out of an area. Low winds can make PM build up in an area. * We collected data for a short time. Do you think **air quality** changes over a longer time?   Yes, air quality changes over time depending on changes in natural and human-made PM sources. Natural sources include wildfire smoke, volcanoes, dust storms, etc. and human-made sources include vehicle exhaust, fireplace smoke, factory exhaust, burning fossil fuels for energy, etc. These sources change depending on natural and human actions. |